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Applications of Plants Leaf Biosorbents for Removal of Heavy Metals from Contaminated Water

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Human and industrial activities produce and discharge wastes containing heavy metals into the water resources making them polluted and threatening human health and ecosystem. Conventional methods for the removal of heavy metals such as chemical precipitation and membrane filtration are more expensive when treating large amounts of water, inefficient at low concentrations of metal and generate large quantities of sludge and other toxic products that require careful disposal. Bio-sorption is eco-friendly and alternatives methods for treatment of waste water. These methods have advantages over conventional methods because it has a lower cost, easily available and reused. Every bio-sorbent had different physical, chemical, biological properties for heavy metals removal by bio-sorption from water. The heavy metals sorption capacity of biosorbent was significantly increased by the modification of biosorbent materials. It was proved that the developed sorbent can be used as a highly effective material to remove heavy metals from the aqueous solutions, both synthetic solutions and real wastewater. These processes can be made economical by regenerating and reusing the bio-sorbent after removing the heavy metal. Biosorption is influenced by the various process parameters such as pH, temperature, initial concentration of the heavy metal ions, biosorbent dosage and speed of agitation. The various bioreactors can be used in biosorption for removal of metal ions from large volumes of water or effluents. The biomass dosage increment resulted in an increase in removal efficiency, which can be representing to the availability of more surface areas of the biosorbent. This study help in initially screening various bio-sorbent media for setting up treatment plants may at community level or household levels in developed and underdeveloped countries.